

REMARKS

In response to the above-identified Office Action (“Action”), Applicants traverse the Examiner’s rejection of the claims and seek reconsideration thereof. Claims 1-13 are pending in the present application. Claims 1-13 are rejected. In this response, no claims are amended, no claims are cancelled and no claims are added.

I. Information Disclosure Statement

In the outstanding Action, the Examiner objects to the information disclosure statement (IDS) filed April 8, 2005 because it fails to comply with 37 CFR 1.98(a)(3). In particular, objects to the IDS because it does not include a concise explanation of the relevance of the documents EP1075168 and FR2702119. Applicants respectfully submit that these documents were cited in a PCT search report for PCT/FR03/01661 dated September 30, 2003 which was also enclosed with the IDS. The relevance of the documents is indicated on page 5 of the PCT search report and was further identified by Applicants on page 2 of the IDS. Applicants therefore do not believe any further explanation is required to comply with 37 CFR 1.98(a)(3). Applicants therefore respectfully request that the cited references be considered by the Examiner, that the PTO/SB/08 citation form be initialed by the Examiner to indicate such consideration and a copy thereof returned to Applicants. For the Examiner’s convenience, enclosed is another copy of the PTO/SB/08 form.

II. Drawings

Applicants respectfully submit herewith amendments to Figures 1 and 2. In particular, Figures 1 and 2 are amended to correctly designate the figures as Prior Art as requested by the Examiner. The amended drawings sheets are submitted in the form of a “Replacement Sheet” in compliance with 37 CFR 1.121(d). Accordingly, Applicants respectfully request entry of the amendments to Figures 1 and 2 and withdrawal of the objection to Figures 1 and 2 on this basis.

III. Claim Rejections – 35 U.S.C. §103

A. In the outstanding Action, claims 1, 2, 4, 6, 7, 9 and 11-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,165,274 issued to Akiyama et al. (“Akiyama”) in view of U.S. Patent No. 6,114,811 issued to Wu (“Wu”). Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, the Examiner must set forth “some articulated reasoning with some rational underpinning to support the conclusion of obviousness.” See KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007). In combining prior art elements to render the claimed combination of elements obvious, the Examiner must show that the results would have been predictable to one of ordinary skill in the art. See Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103, Section III(D), issued by the U.S. Patent and Trademark Office on October 10, 2007.

In regard to independent claim 1, Applicants respectfully submit Akiyama in view of Wu fails to disclose or render predictable at least the elements of “a coaxial applicator of microwave energy, of which one end is connected to a production source of microwave energy” and “each applicator comprising a central core which is substantially flush with the wall of the chamber” as recited in claim 1.

The Examiner alleges that Akiyama discloses the claimed coaxial applicator, however, admits that Akiyama fails to teach a central core being substantially flush with the wall of the chamber. See Action, page 3. The Examiner instead alleges that Wu discloses a length of central core 10 is flush with the thickness of wall 7 and that the length of the core is related to the amount of microwave energy to be coupled through the central core and is optimized for controlling the energy being coupled through the central core. The Examiner alleges it would therefore be obvious to optimize the length of the central core in Akiyama in view of Wu to teach the claimed combination of elements. Applicants respectfully disagree.

Applicants respectfully submit that the device in Akiyama does not include a coaxial applicator

- 1) whose one end is connected to a production source of microwave energy, and
- 2) whose central core can be flush with the wall of the chamber.

In regard to the element of a coaxial applicator whose one end is connected to a production source of microwave energy, Akiyama teaches that the **cathode electrode 203 is electrically connected to a high frequency power source 111** through a matching circuit 209. See Akiyama, col. 6, line 51 to col. 7, line 15 and Figures 2-3.

In fact, Akiyama applies a high frequency voltage to the electrode 203 while the Applicants apply, in the present application, a microwave in a propagation structure acting like a waveguide, the waveguide being the coaxial structure. No voltage is applied to the claimed coaxial structure.

Moreover, the frequency of the power source 111 in Akiyama is in the range of **20 MHz to 450 MHz** and one example given is 105 MHz. See Akiyama, col. 6, lines 5-7 and col. 7, lines 35-38. This range of frequencies **does not correspond to the microwave domain** (the microwave domain ranges from approx. 900 MHz to 100 GHz, the example of 2.45 GHz being cited in Akiyama in col. 1, line 31). Akiyama clearly distinguishes between RF plasma CVD (13.56 MHz) and microwave plasma CVD (2.45 GHz). See Akiyama, col. 1, lines 18-20 and col. 1, lines 29-31.

Therefore, as the device of Akiyama is in the RF range, it **cannot be in the microwave range**, as alleged by the Examiner.

The device of Akiyama does not therefore comprise means for producing energy in the microwave spectrum, and does not comprise a coaxial applicator whose end is connected to microwave production means, as recited in claim 1.

In regard to the element of a central core flush with the wall of the chamber, Akiyama discloses that the high frequency power introduction means comprises a **cathode electrode 203** (central conductor 1004) which is situated **in a reaction chamber 100**. See Akiyama, col. 6, line 51 to col. 7, line 15, Figures 2-3. The cathode electrode 203 **penetrates** a wall of the reaction chamber 100 through a high frequency power introduction portion 301.

About the central conductor 1004, there is provided an insulation member 1002 and an insulating member 1008 in order to electrically isolate the central conductor 1004 from an outer conductor 1005 and the reaction chamber's wall 1001.

The outer conductor 1005 is electrically and mechanically connected with the reaction chamber's wall 1001, and it forms a coaxial structure together with

- the central conductor 1004 and
- the insulating members 1002 and 1008.

The **generation of the plasma takes place around the electrode 103**, thanks to **glow discharge**. See Akiyama, col. 7, line 40.

Thanks to this glow discharge, a film can be formed on the electrode. See Akiyama, col. 15, lines 5-8.

The electrode therefore has to be placed in the reaction chamber, otherwise no discharge and no deposition can take place.

The electrode cannot be flush with the reaction chamber's wall. As already mentioned, the coaxial structure of claim 1 is not an electrode, as no voltage is applied to the structure. The structure acts as a waveguide, whose end is flush with the chamber's wall.

Applicants respectfully disagree with the Examiner when he says that the teaching of Wu can be combined with the teaching of Akiyama to disclose the element of a central core flush with the wall of the chamber.

As already mentioned, the device of Akiyama works in the RF field, and involves glow discharge for producing the plasma.

On the contrary, most of the devices of Wu work **in the microwave field**. See Wu, col. 4, lines 61-65. Thus, Wu does not involve any discharge as antennas radiate microwave energy. See Wu, col. 5, lines 50-51.

The working modes of the microwave devices of Wu and the device of Akiyama are therefore **completely different**.

The microwave structure of Wu cannot be combined with the RF structure of Akiyama. This difference of working modes is mentioned in Akiyama in col. 1, lines 18-20 and lines 29-31, and in Wu in col. 6, lines 40-43.

To underline this idea, Applicants respectfully note that **the coaxial structure of Wu (see Fig. 12) does not work in the microwave field**. See Wu, col. 6, lines 40-43.

On the one hand, even if combined with Akiyama, this coaxial structure does not complete the teaching of Akiyama to arrive at the claimed combination of elements, as the central core of Wu is similar with the central core of Akiyama and is not flush with the chamber's wall (see Fig. 12).

On the other hand, the microwave structures of Wu as shown in Figures 1-11 may not be relied upon to render obvious the device of claim 1, as they fail to disclose the following features:

- coaxial applicators working in the microwave field, and
- a space between a core of the coaxial applicator and the all of the treatment chamber completely filled with a dielectric material.

In the microwave structure of Wu, only radiating antennas 10 are disclosed, and **no dielectric material** is filled in the space between the central core and the chamber's wall.

In the invention, the coaxial structure propagates microwaves and does not radiate the microwaves: the coaxial structure does not act as an antenna.

Thus, for at least the foregoing reasons, Akiyama and Wu may not be relied upon to disclose or render predictable each and every element of claim 1. Since each of the elements of claim 1 are not provided by the cited prior art references, a *prima facie* case of obviousness may not be established. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. §103 over Akiyama and Wu.

In regard to claims 2, 4, 6, 7, 9 and 11-13, these claims depend from claim 1 and incorporate the limitations thereof. Thus, for at least the reasons that claim 1 is not *prima facie* obvious over Akiyama and Wu, claims 2, 4, 6, 7, 9 and 11-13 are further not obvious over the cited prior art references. Applicants respectfully request reconsideration and withdrawal of the rejection of claims 2, 4, 6, 7, 9 and 11-13 under 35 U.S.C. §103 over Akiyama and Wu.

B. In the outstanding Action, claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akiyama as applied to claims 1, 2, 4, 6, 7, 9 and 11-13, and further in view of U.S. Patent No. 6,156,667 issued to Jewett (“Jewett”). Applicants respectfully traverse the rejection.

Claim 3 depends from claim 1 and incorporates the limitations thereof. For at least the reasons previously discussed, Akiyama fails to disclose or render predictable at least the elements of “a coaxial applicator of microwave energy, of which one end is connected to a production source of microwave energy” and “each applicator comprising a central core which is substantially flush with the wall of the chamber” as incorporated into claim 3 from claim 1. The Examiner has further not pointed to, and Applicants are unable to discern, a portion of Jewett curing the deficiencies of Akiyama with respect to claim 3. Rather, the structure of Jewett only concerns heat removal from dielectric parts. See Jewett, Abstract. Thus for at least the foregoing reasons, claim 3 is not *prima facie* obvious over Akiyama and Jewett. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 3 under 35 U.S.C. §103 over Akiyama and Jewett.

C. In the outstanding Action, claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akiyama in view of Wu as applied to claims 1, 2, 4, 6, 7, 9 and 11-13, and further in view of U.S. Patent No. 6,279,504 issued to Takaki et al. (“Takaki”). Applicants respectfully traverse the rejection.

Claim 5 depends from claim 1 and incorporates the limitations thereof. For at least the reasons previously discussed, Akiyama and Wu fail to disclose or render predictable at least the elements of “a coaxial applicator of microwave energy, of which one end is connected to a production source of microwave energy” and “each applicator comprising a central core which is

substantially flush with the wall of the chamber” as incorporated into claim 5 from claim 1. The Examiner has further not pointed to, and Applicants are unable to discern, a portion of Takaki curing the deficiencies of Akiyama with respect to these elements. Rather, similar to Akiyama and Wu, Takaki discloses a device working in the RF frequencies and not in the microwave frequencies. For example, Takaki discloses in the abstract “a high-frequency power supply (...) supplying an electrode high-frequency power of 30 MHz to 600 MHz.” **Accordingly, the same analysis as for Akiyama and Wu can therefore be done for Takaki.** Thus for at least the foregoing reasons, claim 5 is not *prima facie* obvious over Akiyama, Wu and Jewett. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 5 under 35 U.S.C. §103 over Akiyama, Wu and Jewett.

D. In the outstanding Action, claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akiyama in view of Wu as applied to claims 1, 2, 4, 6, 7, 9 and 11-13, and further in view of U.S. Patent No. 5,234,565 issued to Yoshida (“Yoshida”). Applicants respectfully traverse the rejection.

Claim 8 depends from claim 1 and incorporates the limitations thereof. For at least the reasons previously discussed, Akiyama and Wu fail to disclose or render predictable at least the elements of “a coaxial applicator of microwave energy, of which one end is connected to a production source of microwave energy” and “each applicator comprising a central core which is substantially flush with the wall of the chamber” as incorporated into claim 8 from claim 1. The Examiner has further not pointed to, and Applicants are unable to discern, a portion of Yoshida disclosing that the coaxial applicator is arranged in the wall of the treatment chamber, each applicator comprising a central core substantially flush with the wall of the chamber. Rather, the coaxial structure of Yoshida is arranged with a glass container, and not in the wall of the chamber. See Yoshida, Abstract. Thus for at least the foregoing reasons, claim 8 is not *prima facie* obvious over Akiyama, Wu and Yoshida. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 8 under 35 U.S.C. §103 over Akiyama, Wu and Yoshida.

E. In the outstanding Action, claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akiyama in view of Wu as applied to claims 1, 2, 4, 6, 7, 9 and 11-13, and

further in view of U.S. Patent No. 5,368,685 issued to Kumihashi et al. ("Kumihashi").

Applicants respectfully traverse the rejection.

Claim 10 depends from claim 1 and incorporates the limitations thereof. For at least the reasons previously discussed, Akiyama and Wu fail to disclose or render predictable at least the elements of "a coaxial applicator of microwave energy, of which one end is connected to a production source of microwave energy" and "each applicator comprising a central core which is substantially flush with the wall of the chamber" as incorporated into claim 10 from claim 1. Kumihashi further fails to disclose each of these elements. See, for example, element 4 in Figures 1-3 of Kumihashi. Thus for at least the foregoing reasons, claim 10 is not *prima facie* obvious over Akiyama, Wu and Kumihashi. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 10 under 35 U.S.C. §103 over Akiyama, Wu and Kumihashi.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending, namely claims 1-13, are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. Questions regarding this matter should be directed to the undersigned at (310) 207-3800.

PETITION FOR EXTENSION OF TIME

Per 37 C.F.R. 1.136(a) and in connection with the Office Action mailed on JANUARY 2, 2008, Applicants respectfully petition Commissioner for a three (3) month extension of time, extending the period for response to JULY 2, 2008. The amount of \$1050.00 to cover the petition filing fee for a 37 C.F.R. 1.17(a)(3) large entity will be charged to our Deposit Account No. 02-2666.

Respectfully submitted,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being submitted electronically via EFS Web to the United States Patent and Trademark Office on June 26, 2008.

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